

Illustrations and Descriptions of some Species of *Pyrrhopyginae* from Costa Rica, Panama and Colombia (Hesperiidae)

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About eleven years ago, the authors (1969) described a new subspecies of *Pyrrhopyge creon* Druce from Panama' and remarked that it was not possible to make a definite statement about the distribution of the species as a whole. In the intervening years, the junior author has observed and collected *creon* in a number of different localities in Panama' and Costa Rica with some unexpected results. It is the purpose of this paper to bring our knowledge of this interesting species up-to-date.

Nominate *creon* is distributed continuously from Northern Costa Rica to Coclé' Province, Panama' along both the Atlantic and Pacific slopes of the series of cordilleras forming the continental divide. The axis of this divide runs generally in a northwest to southeast direction. More specifically, the northwesternmost locality at which *creon creon* has been collected is Guanacaste Province, Costa Rica, from which it is distributed in a general southeastward direction through the Cordillera Central and the Cordillera Talamanca, the last of which enters Panama' in western Chiriquí' province. The continental divide then continues in an easterly direction as the Cordillera of Tabasara', which terminates slightly northwest of the town of Penonome', Coclé' Province. The southeasternmost record is from near the town of El Cope', Coclé', virtually at the terminus of this cordillera. The Atlantic slope has a year-round wet climate and here the butterfly is found from an elevation of 750 m up to 2000 m. Most of the Pacific slope has a pronounced dry season from December to April, and in these areas it seems to be found only above 1000 m. However, the Pacific slope of the Cordillera Tabasara' has the same climate as the Atlantic slope, and here *creon* can be found again as low as 750 m.

Throughout this range of more than 400 kms. in length, there is continuous highland with elevations greater than 750 m. However, there are two distinct regions, in each case separated by less than 40 kms. from the main range, where the species has developed striking and distinctive subspecies. In each case there is an intervening area of lower elevation



Fig. 1. Upper row, left to right: (A) *Pyrrhopyge creon taylori* Nicolay & Small ♂ holotype, (B) *Pyrrhopyge creon lilliana* Nicolay Small ♂ paratype, (C) *Pyrrhopyge creon* Druce ♂. Middle row, left to right: (D) *Pyrrhopyge creon taylori* Nicolay & Small ♀ allotype, (E) *Pyrrhopyge creon lilliana* Nicolay & Small ♀ paratype, (F) *Pyrrhopyge creon* Druce ♀. Bottom row, left to right: (G) *Mimonides aerata* Godman & Salvin ♂, (H) *Pyrrhopyge sangaris* Skinner ♂.

which apparently serves to keep their populations isolated. In neither case have any specimens that could be called intergrades or hybrids with typical *creon* been found.

The first of these regions is an isolated massif with elevations from 750 m to 1000 m of little more than 30 kms. in length located in extreme eastern Coclé Province and extreme western Panamá Province. This includes the well known collecting localities of Cerro Campana and La Mesa (north of El Valle). It lies about 40 kms. to the east of the eastern terminus of the Cordillera of Tabasara', and is separated from the latter by a low lying area of less than 500 m. The climate here is not as wet as in the Cordillera of Tabasara', and in the months of December to April there is little precipitation, although the forest remains evergreen due to frequent mists and cloud cover. Here occurs the very distinctive subspecies *lilliana* as described by the authors in 1969.

The isthmus of Panama' then turns northeastward and altitudes of 750 m and over are not encountered again until the region of the watershed of the Chagres River, about 80 kms. to the northeast. Despite intensive collecting in this region, there has been no sign of *creon* either here or further east toward Colombia.

The second region lies in southeastern Costa Rica in the province of Puntarenas, where south of the Cordillera of Talamanca (Continental Divide) there occurs an isolated range, the Fila Cruces, of approximately 30 kms. in length, and with elevations of up to 1500 m. Between this range and the Cordillera of Talamanca is the valley of the Rio Coto Brus, a relatively low lying area with elevations less than 1000 m and with a strong dry season of four months with little cloud cover. There are no records of *creon* from this valley, which averages about 25 kms. in width. About 6 kms. south of the town of San Vito de Java is the Las Cruces Tropical Garden, situated at an elevation of about 1200 m on the northern flanks of the Fila Cruces. The property includes a forest preserve of over 100 hectares extending down to the Rio Java at almost 1100 m, and then up the other side of the valley of this river. Here, and presumably throughout the Fila Cruces in similar environments, occurs an isolated and distinctive subspecies of *creon* which we take pleasure in dedicating to its discoverer, Mr. Thomas Taylor.

***Pyrrhopyge creon taylori* Nicolay & Small, new subspecies**

Figures 1A, 1D, 2

Male: Length of forewing, 28 mm \pm 1; holotype 28 mm. Upperside: forewing a dark, shining bronze-purple with a relatively narrow, vaguely defined dark border on the outer margin and the apex. Hindwing with the disc shining purple with an even deeper bronze sheen, the dark border of the wing margin somewhat wider than that of the forewing and more sharply defined. There is a single orange-red sub-tornal spot in space 1-1b, the same size and form as in the nominate species. Underside: the purple coloring of the upper side is repeated but without the shining brilliance, is more subdued and has a smoky cast. The sub-tornal orange-red spot of the upper side is repeated in like manner. Fringes concolorous with the dark outer border.

The abdomen, thorax, tegulae, collar, leg clothing are black; the palpi and head are covered with intermixed dark reddish-brown and black hairs.

Female: Length of forewing, 33 mm \pm 1 mm; allotype 33 mm. Upper and undersides with all coloring and maculation the same as in the male.

Holotype male, Finca Las Cruces, San Vito (1150 m), Puntarenas, Costa Rica, 23 VI 1976, G. B. Small, Jr. Collector. Allotype female, same locality and collector, 24 VI 76. There are 54 male and 20 female paratypes collected by G. B. Small at the type locality with dates ranging from 22 VI to 3 VII 1976. Additionally, there are 9 male and 1 female paratypes

collected by Thomas Taylor from the type locality dated 13-20 VI and in VIII 1971. The holotype is deposited in the Allyn Museum of Entomology, Sarasota, Florida, the allotype in the U. S. National Museum collection, Washington, D. C. Paratypes are deposited in the British Museum (Natural History), The American Museum of Natural History and the Carnegie Museum of Natural History.

As in the case of the subspecies *lilliana*, the male genitalia clearly indicates the subspecific relationship of *taylori* to nominate *creon*. And, unlike *lilliana*, the facies and general configuration of *taylori* is much closer to *creon*, the primary and notable difference being only the basic color. The shining bronze-purple color is unlike that of any other species of the genus with which we are familiar. A striking feature of the *creon* complex of 3 subspecies is that there are no known intergrades, nor have we seen or taken any specimens that could not be placed at once in the correct subspecies. Yet, the male genitalia of all three show little or no difference and, in fact, are absolutely identical, even to the rather subtle asymmetry of the valvae.

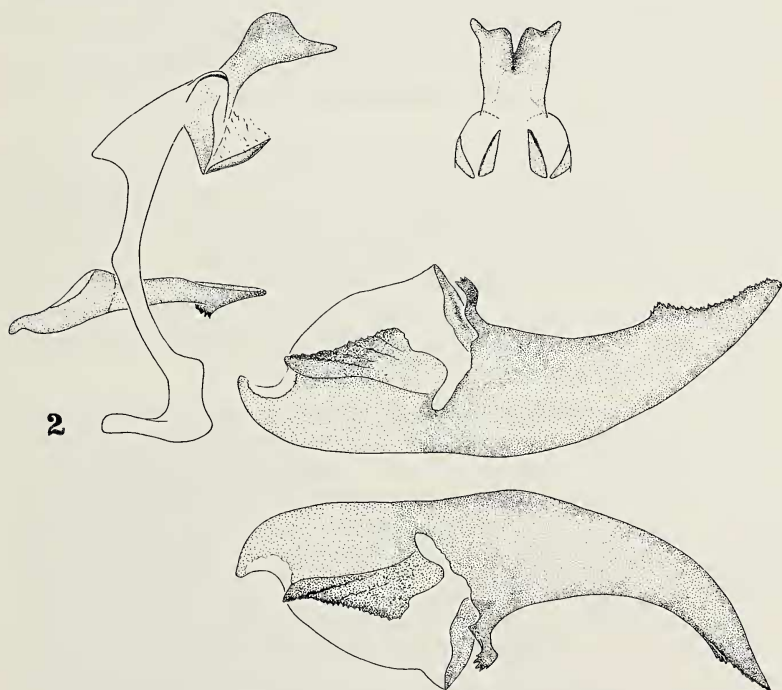


Fig. 2. Male genitalia - *Pyrrhopyge creon taylori* - lateral view of uncus, aedeagus in place, inner surface of both valvae and a ventral view of the uncus.

Discussion

It is apparent that notwithstanding its considerable capabilities for strong flight, *creon* is a very sedentary insect, for gaps of unsuitable territory of no more than 30 to 40 kms. are sufficient to keep populations separated.

All of the subspecies have the following traits in common:

(1) individuals are numerous, even abundant, at suitable places and seasons.

(2) males perch with outstretched wings on the tips of leaves from 8 to 40 feet above the ground.

(3) the perching behavior of the males commences around 9:30 a.m., is most prevalent from this time until about 11 a.m. and ceases altogether about 12:30 p.m.

(4) perching males are quite belligerent toward other passing lepidoptera, but are unwary and easy to capture.

(5) females are much more rarely seen, and then usually searching for the larval foodplant.

(6) both sexes are partial to a wide variety of flowers, particularly *Eupatromium* and are most frequently seen thereon between 8 and 9 a.m. (later at higher altitudes and/or depending on weather conditions.)

On the other hand, there appear to be certain differences in the behavior of the various subspecies.

P. creon lilliana perches somewhat lower than the other subspecies, usually from 8 to 16 feet above the ground. *P. creon creon* often perches extremely high and is therefore usually quite difficult to net except when at flowers. *P. creon taylori* appears to perch somewhat higher than *lilliana* but lower than *creon*. Since *lilliana* and *taylori* have been taken only at two localities and one locality respectively, the data on them are perhaps influenced by the nature of the terrain where they were taken, and may therefore be inconclusive.

At Santa Fe, Veraguas, males of *creon creon* were seen by both authors to fly virtually ceaselessly under the canopy of a mature wet forest at heights of 12 to 20 feet above the ground evidently looking for females. They settled very infrequently, and did not return to a given perch as in normal perching behavior, making it almost impossible to catch them. This behavior pattern is perhaps limited to the interior of forests. In any event, at this locale no individual was seen to engage in "normal" perching behavior, either in the interior of the forest or along its borders. Such behavior has never been observed in *lilliana* and seems to be only occasional in *taylori*.

In view of the considerably different appearance of *lilliana* from typical *creon*, and the differences in habits mentioned above, it may be that *lilliana* should be considered a full species. On the other hand, the genitalia of *creon* and *lilliana* are essentially identical, and *lilliana* is clearly derived

from *creon* stock. So, it appears that until some evidence of breeding incompatibility between them may be produced, the relationship between these allopatric taxa is best expressed by the subspecific concept.

Unfortunately, nothing is known at present about the foodplants or life histories of *creon* and its subspecies.

Specific records:

Recorded below are the data on material studied in the institutional collections as indicated: (BM) British Museum (Natural History); (AM) American Museum of Natural History; (USNM) U. S. National Collection, Smithsonian Institution; (AME) Allyn Museum of Entomology; localities without an institutional designation are those collected by the authors.

Pyrrhopyge creon creon: No data 6 ♂ 2 ♀ (BM), (USNM)

Costa Rica: 6 ♂ 2 ♀ (BM)

Tres Rios 2 ♂ (BM)

Cartago 3 ♂ 2 ♀ (BM)

Moravia de Chirippo (1100m) - August

Guanacaste 1 ♂ (BM)

San Jose 1 ♂ (AM) 1 ♂ (USNM)

San Geronimo 4 ♂ (USNM)

Heredia

Volcan Barba (2000 m) - August

Puntarenas

Monteverde (sight record - GBS)

Panama':

Chiriqui 4 ♂ 6 ♀ (BM); 1 ♂ 1 ♀ (USNM)

Sta. Clara (1200 m) July 3 ♂ (GBS)

Cerro Colorado (Continental Divide) 1450 m July-Oct.

40 ♂ 10 ♀ (GBS)

Veraguas 1 ♂ (BM)

Sta. Fe (800 m) Sept. 1 ♂ (GBS) 2 ♂ 1 ♀ (SSN)

Cocle'

El Cope (600 m) Dec. 1 ♂ (GBS)

Colombia 1 ♂ (BM) (?)

Pyrrhopyge creon lilliana

Panama':

Panama'

Cerro Campana (800 m) July-Dec. 50 ♂ 8 ♀ (GBS)

Cole'

La Mesa (800 m) Dec. 1 ♂ (GBS)

Pyrrhopyge creon taylori

Costa Rica:

Puntarenas

Finca Las Cruces, San Vito (1150 m) July-Aug.

50 ♂ 17 ♀ (GBS) 6 ♂ (AME)

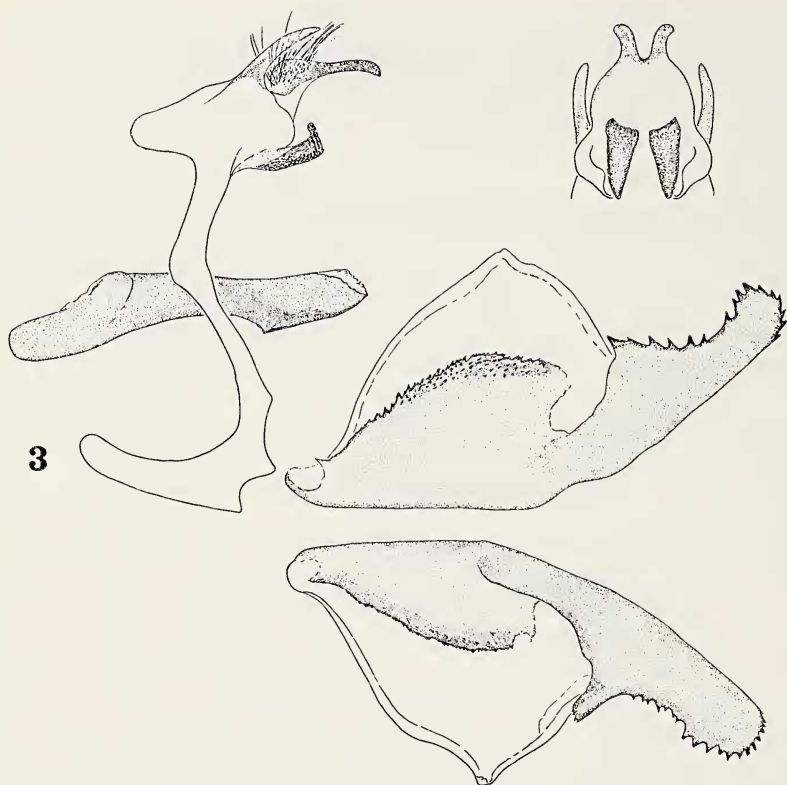


Fig. 3. Male genitalia - *Pyrrhopyge sangaris* - lateral view of uncus, aedeagus in place, inner surface of both valvae and a ventral view of the uncus.

The concept of this paper, begun more than three years ago, was originally limited to a discussion of the species *creon* and a description of the new subspecies *taylori*. Subsequent discovery of two male specimens of *Pyrrhopyge sangaris* Skinner, and more notably, two male specimens of *Mimoniades* (*Pyrrhopyge*) *aerata* Godman & Salvin in the Carnegie Museum collection provided us with the incentive and material to expand this study to include all three species listed by Evans (1951) at the beginning of his VIII. Hygieia Group.

***Pyrrhopyge sangaris* Skinner**

Figures: 1H, 3

Pyrrhopyge sangaris Skinner, 1921, 32: 236-237. Bell, 1931, 39: 467. Evans, 1951, Part I, p 31.

Sangaris has never been illustrated. Superficially it is similar to *creon*, but all wing shapes are more sharply angular and there is no mistaking the

lustrous bronze-green color of *sangaris* as contrasted to the deep, shining blue of *creon*. Skinner's original description is quoted below. The male is figured together with an accurate line drawing of the genitalia.

"...Palpi crimson with tips black. Abdomen and legs dark green-black.

Upperside. Primaries shining green-black. Secondaries shining green-black, somewhat darker than the primaries, with a blood-red spot near the anal angle. This spot is quadrate, 4 mm. wide and is 3.5 mm. from the inner margin and about the same distance from the outer margin.

Underside. Primaries as above but lighter in color with the crimson spot repeated but somewhat smaller and rounder. Expanse (one wing) 23 mm. Inner margin of hind wing 21 mm.

Type one male in the collection of The Academy of Natural Sciences of Philadelphia, taken at Hacienda Cincinnati, Sierra San Lorenzo, Magdalena, Colombia, July 23rd, 1920, Academy Colombia Expedition, Rehn and Hebard.

This handsome species has a superficial resemblance to *creon* Druce but has the shape of *phidias* Linn."

A total of 5 specimens of *sangaris* were examined in the course of this study. Three in the British Museum (Natural History), 2 males and a female from Onaca, Santa Maria, Colombia. Two males in the Carnegie Museum are from Valpariso (4500 ft.), Dept. of Magdalena, Colombia, December.

Mimoniades aerata (Godman & Salvin) new combination

Figures: 1G, 4

Pyrhopyge aerata Godman & Salvin, 1879: 152, pl 14, fig 3. Mabilie & Boulet, 1908: 177, 182. Draudt in Seitz, 1922, 5: 839, pl 166a. Bell, 1931, 39: 468. Evans, 1951, Part I, p 31.

As far as can be determined, the two male specimens of *aerata* in the Carnegie Museum of Natural History are the only two known: the type, a female in the British Museum (Natural History) is still unique in that collection. Upon examination of the male genitalia, it became readily apparent that *aerata*, belongs to the genus *Mimoniades* and not *Pyrhopyge*. The antennal apiculus and wing venation are also characters compatible with these features found in *Mimoniades*. A description of the male follows:

Male: Length of forewing, 28 mm. Upperside: forewing shining bronze-green with darker shading on the outer third of the wing. Hindwing bronze-green with the basal half covered with back hairs of mixed lengths and density, and all veins somewhat darkened. Underside: bronze-green, the forewing unmarked, the hindwing with 5 orange-red spots, one each in interspaces 1 c and 2, then across the cell (the largest), interspace 6 and a small adjoining spot outside the cell. Cilia concolorous dark green. The

abdomen with a full-length narrow, dorsal black stripe, laterally with 6 orange-red striped alternating with narrow black stripes. The anal tuft, ventral surface of the abdomen and leg clothing black. The thorax, palpi, head, collar and tegulae, black. There are two inconspicuous pale yellow tufts of hair in the collar located just behind the very minute and inconspicuous yellowish tufts of hair at the base of the antennae. The antennal club shaped as for the genus, rather stout and tapered to a blunt point only at or near the tip.

The male genitalia, figured here for the first time is of a similar form to that of the species *Mimoniades montra* Evans. The undivided uncus is long, without side flanges and in lateral view appears like a long, slender bird's neck and head. The valvae are asymmetrical and heavily spined, the aedeagus slender, bent ventrally and without spines.

All specimens known are from the Dept. of Magdalena, Colombia with specific data as follows:

Female type, Puebla Viejo, Sierra Nevada de Santa Marta (BM)

Males (2) El Libano (6000 ft.) Dept. Magdalena, Colombia (May)

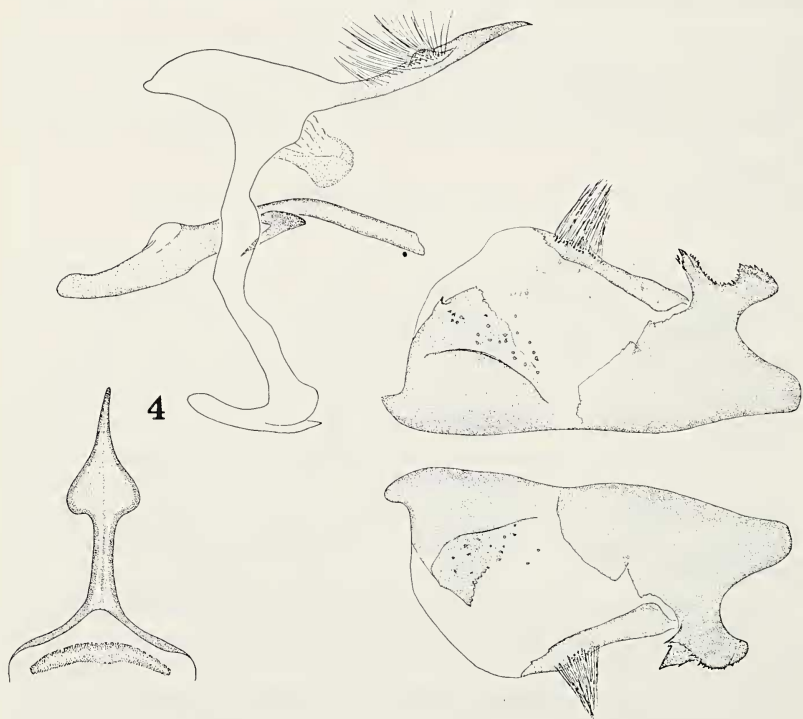


Fig. 4. Male genitalia - *Mimoniades aerata* - lateral view of uncus, aedeagus in place, inner surface of both valvae and a ventral view of the uncus.

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